



An Update on GPM Products and Services at the GES DISC



2018
PMM
Science
Team
Meeting

NASA/Goddard EARTH SCIENCES DATA and INFORMATION SERVICES CENTER (GES DISC)

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Abstract

This poster describes our latest activities with regard to GPM, TRMM, and other precipitation products and services at the NASA Goddard Earth Sciences (GES) Data and Information Services Center (DISC), including:

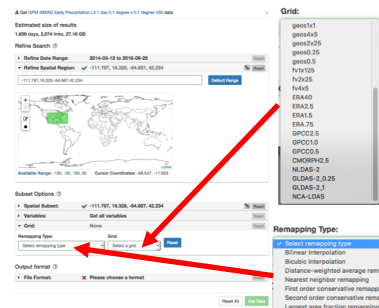
- Update on GPM products and data services
- Data and service access metric analysis
- New features in Giovanni
- Ongoing development activities
- Outreach activities

Data and services update:

- Improved GES DISC Web portal for data and information search and ordering
- Release of TRMM Version 08 products (now a part of GPM V05 product suite with GPM algorithms)
- Release of GPM Version 05 products for the TRMM era
- The NOAA NCEP merged IR product has been restored to online availability
- Multiple ways to access data (subsets, tiles, GDS, OpENDAP, THREDDS, WMS/WCS)
- Datalist capability: Hurricane Datalist, containing essential variables for hurricane research
- One-month IMERG-Final half-hourly video available in YouTube

Ongoing development activities:

- New IMERG subsetter (see below)
- Level-2 product subsetting (OpENDAP is available now)
- Continue to improve data and information access (e.g. a poster of using natural language processing to access data analysis and visualization for the upcoming Goddard AI Workshop)



Left: A new subsetter is under development. It will provide more features such as regridding options for different data product grids, to facilitate intercomparison activities. More can be developed to enhance subsetting capabilities such as allowing time series subsetting for a given point, customized reprojection to facilitate model development, as well as model and satellite data comparison or evaluation, etc.

Metrics of Distinct Users (IPs)

Distinct Users	Y2008	Y2009	Y2010	Y2011	Y2012	Y2013	Y2014	Y2015	Y2016	Y2017
TRMM	7186	9038	10724	17312	18530	20063	17295	17295	17295	17295
GPM						162	1540	4693	1242	

Above: Many more users access TRMM data for its over 17-year collection, compared to GPM. However, after the retro-processing of IMERG is completed, more users are expected to turn to GPM.

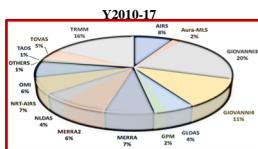
GES DISC Data and Service Access Metrics (Y2010-17)

Metric	Y2010	Y2011	Y2012	Y2013	Y2014	Y2015	Y2016	Y2017
Volume of Data in Archive (TB) (accumulated)	415.6	489.5	542.6	726.7	815.3	1,227.2	1,499.5	1,824.5
Number of Files in Archive (K) (accumulated)	45,553	53,438	56,851	71,379	78,780	85,778	91,995	99,397
Volume Distributed (TB)	781.1	1,087.7	1,553.8	1,675.7	1,904.1	2,321.0	4,602.1	4,504.4
Number of Files Distributed (K)	88,255	137,499	168,818	231,789	274,884	408,288	386,598	340,548
Number of Distinct Users (IPs)	27,592	53,068	54,689	70,967	82,049	94,150	115,577	70,519

Above: Data archives (data volume, number of files) continue to grow at the GES DISC, where users can access other disciplinary datasets from different projects or missions (right), in addition to TRMM and GPM datasets. A challenge is how to design user-friendly data services to facilitate interdisciplinary research and applications.

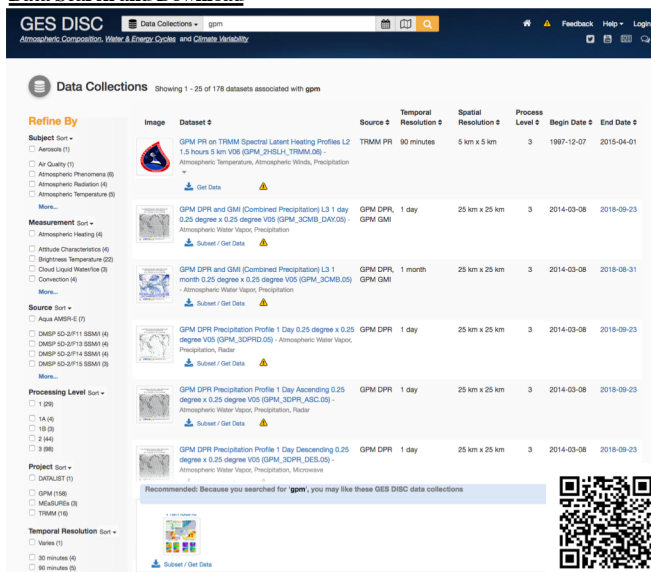
Top 3 projects or missions of distinct users (2010-17, right) are, Giovanni (36%), TRMM (16%), and MERRA (13%), suggesting a large group of users used Giovanni for simple and easy access to data.

A noticeable drop in number of distinct users in 2017 is primarily due to the implementation of Earthdata login (user registration) in August 2016, according to Shie et al. (2017 ESIP Winter Meeting)



Distinct users (in %). Datasets from other NASA missions and projects are available at GES DISC.

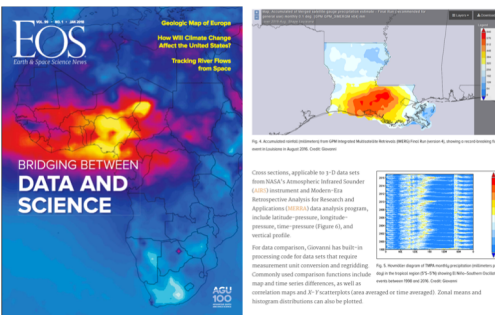
Data Search and Download



The completely redesigned, all-in-one GES DISC Web portal simplifies data and information access. For example, a search for "GPM" returns 178 associated datasets (above). Users can use "Refine by" to narrow down the datasets they want, or provide more specific information in the search box. Users can use "Subset/Get Data" to download data; more options are available on the dataset landing page. A prototype of Datalists at the bottom is a collection of essential variables (wind, precipitation, temperature, etc.) for hurricane research, which was developed by GES DISC support scientists and engineers to facilitate search and ordering of multiple datasets for a research topic. More Datalists at other research areas are being developed. Furthermore, users will be able to create their own Datalists for reordering or sharing with colleagues.

GPM and TRMM Data Service Outreach Activities:

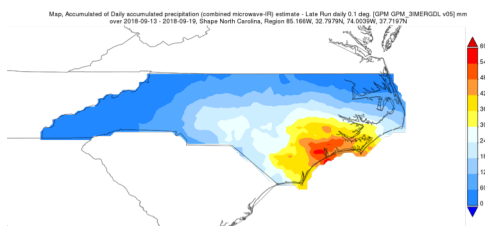
- GES DISC news, Twitter, user forum (nearing implementation), GPM product and service trainings, workshops, etc.
- EOS article and book chapters describing GPM products and services
- Posters, talks, sessions in AGU Fall Meeting, AMS Annual Meeting, IPWG, and other conferences



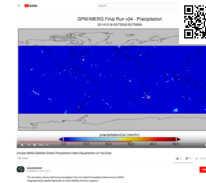
Giovanni article was featured in the front cover of January 2018 EOS with IMERG examples

Giovanni Update:

- Polar projections (North and South)
- Earthdata login required for downloading data
- User-Defined Climatology / Quasi-Climatology map has been renamed "Monthly and Seasonal Averages"
- GeoTIFF downloads contain real data
- Can handle granules which have neither a time dimension or time information embedded in the global attributes
- Vector plots have been restored
- New features were added in most plot options
- Improvements in search and performance



Map of accumulated (September 13 - 19, 2018) IMERG-Late rainfall data product (in mm) for North Carolina, with extreme values due to Hurricane Florence.



YouTube
YouTube video (left) for one-month half-hourly IMERG-Final data. This demonstrates how to make an animation for the entire dataset collection (e.g., IMERG, TMPA 3B42) available in YouTube. Users can access and view each granule of the collection without downloading data and software. Links will be included for accessing original data.



NASA precipitation data and service training for international scientists at the IPWG meeting.

Ongoing Book Chapters:

- Global Satellite Observations for Smart Cities, Taylor and Francis Group (in press)
- Global Satellite-based Precipitation Products, in Rainwater Harvesting (in review)
- NASA Global Near-Real-Time and Research Precipitation Products for Flood Monitoring, Modeling, Assessment, and Research, Flood Handbook by Taylor and Francis (in review)
- Giovanni book including history of TOVAS, examples of GPM products (in preparation)
- Book chapter on applications of data in Giovanni to public health topics (in preparation)

Social Media

Earthdata User Forum

Discussions with scientists and data specialists on your earth science data needs

Follow us on Twitter

https://twitter.com/NASA_GESDISC

https://twitter.com/NASA_Giovanni

Follow us on YouTube

https://www.youtube.com/user/NASAGESDISC



2019 AMS short course about Giovanni and GPM products

GPM products: <https://disc.gsfc.nasa.gov/datasets?keywords=GPM> **Giovanni:** <https://giovanni.gsfc.nasa.gov/> **GES DISC:** <https://disc.gsfc.nasa.gov> **Suggestions or subscription to our mailing list:** gsfc-help-disc@lists.nasa.gov